

CLAIMS:

WHAT IS CLAIMED IS:

1. A method of providing in-band data within a digital speech channel, comprising:
storing in a computer readable medium a codebook comprising N codewords, each uniquely identifiable by a codeword index defining L bits;
using a designated codeword of the codebook in a first frame to identify a stream of in-band data comprising at least one designated frame apart from the first frame in which in-band data is carried; and
in the at least one designated frame, using a first portion D of the L bits of a codeword index to carry in-band data;
wherein N and L are integers greater than one, and D is an integer at least equal to one.
2. The method of claim 1 wherein in the at least one designated frame, a mutually exclusive second portion L-D of the L bits of the index are available to search the codebook.
3. The method of claim 1 wherein the designated codeword is a start codeword, and the at least one designated frame is subsequent to the first frame.
4. The method of claim 3 wherein the codebook defines at least one stop codeword, the method further comprising using the designated stop codeword in a frame subsequent to the at least one designated frame to terminate the stream of in-band data.
5. The method of claim 4 wherein the designated codeword identifies a start to a continuous stream of in-band data, and using the designated stop codeword terminates the continuous stream of in-band data.
6. The method of claim 1 wherein using a designated codeword comprises using a first designated codeword in a first frame to select a first data transmission rate within a first stream, the method further comprising using a second designated codeword in a second frame subsequent

to the at least one designated frame in the first stream to select a second data transmission rate and to identify a second stream of in-band data.

7. The method of claim 6 wherein the first designated codeword selects a first data transmission rate and first effective codebook size for the first stream, and the second designated codeword selects a second data transmission rate and second effective codebook size for the second stream, wherein the first data transmission rate is one of greater than and less than the second data transmission rate and the first effective codebook size is the other of greater than and less than the second effective codebook size.

8. The method of claim 7 wherein the first data transmission rate is less than the second data transmission rate.

9. The method of claim 6 wherein the first designated codeword is selected from among a first group of designated codewords that each select a first data transmission rate and the second designated codeword is selected from among a second group of designated codewords that each select a second data transmission rate that differs from the first data transmission rate.

10. The method of claim 9 wherein each codeword of the first group selects an identical first combination of data transmission rate and effective codebook size, and each codeword of the second group selects an identical second combination of data transmission rate and effective codebook size that differs from the first combination.

11. The method of claim 10 wherein the codewords of the first and second group are start codewords, the method further comprising using one of a group of designated stop codewords in a frame subsequent to the at least one designated frame to terminate the stream of in-band data.

12. The method of claim 10 wherein the number of codewords in the first and second group are identical.

13. The method of claim 1 further comprising:
in at least one frame that is not a designated frame, using all of the L bits to uniquely select a codeword from among all codewords in the codebook except designated codewords that identify one of a start and stop of a stream of in-band data.
14. The method of claim 1 wherein the designated codeword identifies a stream of in-band data comprising a plurality of designated frames.
15. The method of claim 14 wherein each of the plurality of designated frames are dispersed among K non-designated frames that do not carry in-band data, K being an integer greater than one.
16. The method of claim 14 wherein the plurality of designated frames is a fixed number of frames, said fixed number one of a predetermined number that is constant for all designated codewords that identify a start of a stream of in-band data, and a number that varies among at least two designated codewords that identify a start of a stream of in-band data.
17. In a transmitter comprising a codebook of 2^L codewords, each codeword uniquely identifiable over other codewords in the codebook by a codeword index defining L bits, and an encoder for encoding speech into frames using the codebook, the improvement comprising:
the encoder using a designated codeword in a first frame to identify a stream of in-band data defined by at least one designated frame in which speech and data are carried, wherein, in the designated frame, the encoder encodes data using a first portion D of the L bits of a codeword index, wherein L is an integer greater than one and D is an integer at least equal to one.

18. The transmitter of claim 17 wherein, in the at least one designated frame, a mutually exclusive second portion L-D of the L bits of the index are available for the encoder to search the codebook.
19. The transmitter of claim 17 wherein the designated codeword is a start codeword, and the at least one designated frame is subsequent to the first frame.
20. The transmitter of claim 19 wherein the codebook defines at least one stop codeword, and the encoder uses the stop codeword to identify an end of the stream of in-band data.
21. The transmitter of claim 17 wherein the encoder encodes a first designated codeword in the first frame to select a first combination of data transmission rate and effective codebook size within a first stream of in-band data, and the encoder encodes a second designated codeword in a second frame subsequent to the at least one designated frame in the first stream to select a second combination of data transmission rate and effective codebook size within a second stream of in-band data.
22. The transmitter of claim 21 wherein the first designated codeword selects a first value for D, and the second codeword determines a second value for D.
23. The transmitter of claim 21 wherein the first designated codeword is selected from among a first group of designated codewords that each select a first data transmission rate and the second designated codeword is selected from among a second group of designated codewords that each select a second data transmission rate that differs from the first data transmission rate.
24. The transmitter of claim 23 wherein each codeword of the first group selects an identical first combination of data transmission rate and effective codebook size, and each codeword of the second group selects an identical second combination of data transmission rate and effective codebook size that differs from the first combination.

25. The transmitter of claim 24 wherein the codewords of the first and second group are start codewords, wherein the encoder uses one of a group of designated stop codewords in a frame subsequent to the at least one designated frame to terminate the stream of in-band data.
26. The transmitter of claim 24 wherein the number of codewords in the first and second group are identical.
27. The transmitter of claim 17 wherein the improvement further comprises:
in at least one frame that is not a designated frame, the encoder using all of the L bits to uniquely select a codeword from among all codewords in the codebook, except designated codewords that identify one of a start and a stop of a stream of in-band data.
28. The transmitter of claim 17 wherein the stream of in-band data is defined by a plurality of designated frames that are each dispersed among K non-designated frames that do not carry in-band data, K being an integer greater than one.
29. The transmitter of claim 17 within a mobile station.
30. In a receiver comprising a codebook of 2^L codewords, each codeword uniquely identifiable over other codewords in the codebook by a codeword index defining L bits, and a decoder for using the codebook to decode speech, the improvement comprising:
the decoder decoding a designated codeword in a first frame that identifies an in-band stream of data defined by at least one designated frame in which speech and data are carried, wherein, in the designated frame, the decoder decodes data using a first portion D of the L bits of a codeword index, wherein L is an integer greater than one and D is an integer at least equal to one.

31. The receiver of claim 30, wherein, in the at least one designated frame, a mutually exclusive second portion L-D of the L bits of the index are available to the decoder to search the codebook.
32. The receiver of claim 30 wherein the designated codeword is a start codeword, and the at least one designated frame is subsequent to the first frame.
33. The receiver of claim 32 wherein the codebook defines at least one stop codeword, and the decoder uses the stop codeword to identify an end to the stream of in-band data.
34. The receiver of claim 30 wherein the decoder decodes a first designated codeword in the first frame to select a first combination of data transmission rate and effective codebook size within a first stream of in-band data, and the decoder decodes a second designated codeword in a second frame to select a second combination of data transmission rate and effective codebook size within a second stream of in-band data.
35. The receiver of claim 22 wherein the designated frames are not consecutive.
36. The receiver of claim 22 disposed within a mobile station.